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LENDER OF LAST RESORT:  
A CONTEMPORARY PERSPECTIVE

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George G. Kaufman\*

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# Research Paper

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Federal Reserve Bank of Dallas

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George G. Kaufman\*

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**LENDER OF LAST RESORT: A CONTEMPORARY PERSPECTIVE**

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Although much discussed in both the economic and banking literature, the lender of last resort has always been a vague concept. Apparently first discussed by Sir Francis Baring in 1797 and refined by Henry Thornton (1802) and Walter Bagehot (1873), among others, the lender of last resort's function was to prevent financial panics and crises from being ignited by problems at individual institutions or markets. This has generally been interpreted as preventing the individual problem from causing a decline in the aggregate money supply. For example, Thomas Humphrey begins his recent historical review of the lender of last resort with the statement:

Averting banking panics and crises is the job of the central bank. As lender of last resort (LLR), it has the responsibility of preventing panic-induced collapses of the money supply.<sup>1</sup>

But concern over collapse of the money supply has not been very great, at least in the United States, since 1933. In part, this reflects the introduction of federal deposit insurance. Nevertheless, lender of last resort assistance has been provided

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\*This paper was started when the author was visiting the Federal Reserve Bank of Dallas. The paper was improved by constructive suggestions received from Douglas Evanoff, Robert Laurent, Gerald O'Driscoll and Anna Schwartz.

1. Thomas M. Humphrey, "Lender of Last Resort: The Concept in History," Economic Review (Federal Reserve Bank of Richmond), March/April 1989, p. 8.

by the Federal Reserve on a number of occasions, including the Penn Central failure in 1970, the Continental Illinois failure in 1984, the Bank of New York computer failure in 1985, the Ohio Thrift Crisis in 1986, the Texas bank failures in 1987-1988, the potential Bank of New England failure in 1990, and the stock market crashes of October 1987 and October 1989. Of these, only the failure of the Continental Illinois Bank should have been perceived by the Federal Reserve to potentially impact the supply of money. The other events represented shocks that threatened the solvency of large banks or that imposed abrupt reductions in wealth in the nonbank sectors directly involved and that were perceived to threaten similar wealth reductions in other sectors and thus threaten to reduce aggregate income in the economy. Thus, potential reductions in the aggregate money supply no longer appear to be the primary rationale for lender of last resort intervention. This paper reviews the theory of the lender of last resort, discusses its uses through time, and analyzes its applicability to current problems.

### Review of the Theory

The theory of the lender of last resort was developed for economies in which the money supply was primarily specie or paper notes freely converted into specie. These economies were extremely sensitive to exogenous disturbances from internal and external sources. LLR operations were viewed as temporary with only short-term effects and were differentiated from continuing

central bank operations to affect income, employment, and the price level in the longer-term. To borrow current Federal Reserve terminology, LLR were "defensive" operations rather than "dynamic" operations.

When specie was drained from the system because of, say, an outflow to foreign countries (external source) or an outflow from the banks into private hands (internal source) a multiple contraction in note issue occurred. By restricting domestic trade, in the absence of sufficiently flexible prices, such contractions would have adverse effects on levels of real activity in all sectors of the economy. Thus, it would be efficient for a government agency, such as a central bank, to maintain a stock of specie sufficiently large to inject into the economy to prevent the contraction. The LLR was seen as ensuring that the aggregate economy was immunized from the adverse effects of the initial event causing the specie drain, at least as it would be transmitted through decreases in the money supply. According to Bagehot, external drains can be stopped primarily by raising interest rates sufficiently. On the other hand, domestic drains can be stopped by lending freely:

A panic, in a word, is a species of neuralgia, and according to the rules of science you must not starve it. The holders of the cash reserve must be ready not only to keep it for their own liabilities, but to advance it most freely for the liabilities of others. They must lend to merchants, to minor bankers, to "this man and that man," whenever the security is good. In wild periods of alarm, one failure makes many, and the best way to prevent the derivative failures is to arrest the primary failure which causes them.... The

problem of managing a panic must not be thought of as mainly a "banking" problem. It is primarily a mercantile one...

There should be a clear understanding between the Bank (of England) and the public... that they (sic) will replenish it in times of foreign demand as fully, and lend it in times of internal panic as freely and readily, as plain principles of banking require.<sup>2</sup>

A number of observations follow from these statements. External and internal sources of disturbances have different implications. By reducing specie, external disturbances will of necessity reduce the money supply and need to be offset by an equal injection of specie into the economy by the LLR either directly or indirectly by increasing interest rates and attracting species from abroad in order to prevent spill-over to the economy as a whole. Internal disturbances, however, may or may not result in an increase in the demand for specie and a decline in the money supply. Thus, maintenance of the money supply does not appear to be the sole objective. Rather, the LLR should inject whatever specie necessary to relieve the panic and prevent additional business failures. This injection can be through banks or in direct transactions with whoever has "good" security. Good apparently refers to security whose equilibrium market value is not less than the assistance provided by the LLR, but whose instantaneous market value may be temporarily lower as a result of potential "fire-sale" losses. That is, for internal shocks, the LLR should lend freely to curb short-run liquidity

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2. Walter Bagehot, Lombard Street (11th Ed.) (London; Kegan, Paul, Trench, Trubner & Co., 1894). pp. 53, 54, 73.

problems that are independent of underlying equilibrium solvency problems. This rule is considerably broader than preventing a collapse of the money supply per se and appears to focus more directly on preventing a temporary collapse of income regardless of how the shock is transmitted.<sup>3</sup>

Thus, the second sentence of Humphrey's statement limits the role of the LLR to a greater extent than envisioned by Bagehot. If this is so, and the quantity of money cannot be viewed as a criterion, what rules should guide LLR operations? The remainder of this paper discusses such potential guidelines.

To analyze potential guidelines, it is necessary to consider a number of questions:

1. What constitutes a panic or crisis?

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3. Bagehot does not differentiate clearly between lending on good security and lending to good borrowers. He notes that "no advances indeed need be made by which the Bank will ultimately lose." (p. 200) But insolvent institutions generally do hold some good assets, or assets that have a positive equilibrium market value. A few lines later he states that "the majority to be protected, are the 'sound' people, the people who have good security to offer." The Federal Reserve usually restricts its lending to banks that are not declared insolvent by their chartering authority. But, as demonstrated in the Continental Illinois, First Republic, and other large bank cases in recent years, solvent is an elastic term. Nearly all of these banks were insolvent on an economic or market value basis, although not on a book value basis and thus were not declared insolvent by their chartering agency for some time. As discussed later in the paper, the use of open market operations rather than the discount window permits the LLR to escape this dilemma.

During the Ohio S&L crisis of 1985, the Federal Reserve Bank of Cleveland did lend to insolvent institutions on a collateralized basis. The credit was extended "for the purpose of facilitating an orderly closing or merger of the institution [and]... the indebtedness [would]... be assumed, or repaid, by a legal successor of the insolvent institution." Federal Reserve Bank of Cleveland, Annual Report, 1985 (Cleveland, OH), pg. 22.

2. How may individual shocks be transmitted into broader shocks representing crisis or panics?
3. How can the LLR interdict this transmission process or contagion?
4. What are the costs, if any, of such interdiction and how can the LLR evaluate whether assistance should be provided?
5. How should the LLR provide the necessary funding?

#### What Constitutes a Panic or Crisis?

As Garcia and Plautz note, "there is no general agreement on what constitutes a crisis."<sup>4</sup> Webster's Dictionary defines crisis as a time "at which the business organism is severely strained and forced liquidation occurs." Likewise, a financial panic is defined as a "sudden widespread fright concerning financial affairs and resulting in a depression in values caused by... the sale of securities or other properties." The key word in this definition is "sudden". This implies the potential for sudden or abrupt liquidations and temporary or fire-sale losses resulting in the destruction of real wealth that would not occur, or at least not to the same extent, if there was greater time. That is, a financial crisis or panic exists when there is a liquidity problem in one or more important sector of the economy.<sup>5</sup>

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4. Gillian Garcia and Elizabeth Plautz, The Federal Reserve: Lender of Last Resort (Cambridge, MA.: Ballinger Press, 1988), p. 9.

5. Alternatively, Anna Schwartz has defined a financial crisis more restrictively as one:



Correcting a liquidity problem does not imply that equilibrium asset prices may not decline, but only that market prices do not decline so abruptly that there is insufficient time to conduct an efficient search for the highest bidder. Thus, for example, although both are likely to produce fire-sale losses, the sudden appearance of an adverse rumor that is subsequently identified as unfounded would not be expected to depress equilibrium asset values, while a sudden and unexpected military invasion or oil embargo may. Fire-sale reductions in asset prices are of concern to the LLR if they are sufficiently important in themselves to temporarily reduce aggregate real income significantly, even only temporarily, or if they threaten to spill over to other important sectors. How may widespread fire-sale losses arise?

Numerous types of shocks can cause a sudden reevaluation of asset prices either up or down. Some shocks are applicable to one or a very limited number of assets, others may impact prices of a broad array of assets. As discussed earlier, some shocks may cause only temporary equilibrium displacements of asset prices and others a more lasting shift in prices. In either

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fueled by fears that means of payment will be unobtainable at any price and...leads to a scramble for high-powered money, ... is precipitated by actions of the public that suddenly squeeze the reserves in the banking system,... [and] is short-lived, ending with a slackening of the public's demand for additional currency.

Anna J. Schwartz, "Real and Pseudo-Financial Crises" in Forrest Capie and Geoffrey E. Wood, eds. Financial Crises and the World Banking System (New York; St. Martin's Press), 1986 p. 11.

case, in perfect markets, the assets to which the shock applies would attain their new post reevaluation prices immediately and without the need for any transactions (sales). But markets are not perfect and some asset owners may wish to sell their assets immediately upon observing the shock. The prices at which they can sell these assets depends on the liquidity of the particular market.

Liquidity may be defined as the costs involved, including time, in searching out the potentially highest bidders and the underlying equilibrium price. The greater the costs, the less liquid the market. Liquidity varies with the characteristics of the asset traded. The more unique the asset, the smaller the volume outstanding, and smaller the daily trading volume, the less liquid the market and the greater and longer will fire-sale prices be incurred. (Because prices and interest rates are inversely related, fire-sale prices imply interest rate spikes for these assets.) Thus, liquidity may be expected to differ across markets and, for any given time interval after a shock, fire-sale losses will differ from market to market.

But even in the most liquid markets, sudden changes in perceived prices by a sufficiently large number of participants, because of, say, sudden new information, can produce fire-sale prices. In part, this reflects both technological restrictions on trade imposed by the extant mechanics of consummating trades on the particular market and the minimum amount of time necessary for market participants to reassess their strategies in

consideration of the new information and place new buy or sell orders. These factors appear to have been the major causes of the fire-sale prices accompanying the breaks in the stock and derivative markets in October 1987 and 1989, among the most liquid of all markets.

Both matching buyers and sellers and reassessing strategy require finite time, although both are greatly affected by the technology available. The more advanced the technology, the briefer the minimum time period required. Thus, liquidity is largely a technological characteristic and reflects the potential for a temporary mismatching of supply and demand in a particular market or across markets. For a give state of technology and liquidity, the greater the shock, the greater may be expected the resulting volume of transactions and the magnitude of fire-sale losses. LLR intervention cannot affect the state of technology, but can offset its adverse implications by effectively providing additional time through stimulating demand.

Reassessing portfolio strategies by market participants in the wake of an adverse shock and new information is likely to be more difficult and time consuming for securities subject to default risk than for default-free securities, such as U.S. Treasury securities. At such times, there is also a likelihood of an immediate flight to quality as some market participants would rather be safe than sorry. This should worsen the liquidity problem for nondefault-free securities and improve them for default-free securities. Indeed, prices may even rise and

interest rates decline for default-free securities.

It follows that the more liquid a market, the briefer will fire-sale prices be, the less will wealth be reduced in the sector, the less are such prices likely to affect other markets and sectors, and the less is the need for support from the LLR. The role of the LLR is thus to provide liquidity temporarily when market failure causes it to dry up. Both theory and evidence suggest that the LLR, or any other monetary assistance, cannot increase real income for extended periods of time and, therefore, should not be provided to attempt to offset lasting real income declines from the initial shocks.

As financial markets have become broader and the volume of transactions has increased, the mechanisms for providing liquidity have also improved so that fire-sale losses on particular markets from shocks of the same magnitude should be smaller and shorter-lived than earlier. Markets have become more efficient. However, at the same time, innovations in computer and telecommunications technology have increased both the speed at which transactions may be consummated and the volume of transactions that may be conducted. This has increased the potential for abrupt price changes and fire-sale losses in response to shocks. That is, there has been a race between advances in technology that have improved the mechanism for providing liquidity and advances in technology that have encouraged increases in transaction volume. The net effect on liquidity and the potential for the magnitude and length of fire-

sale losses is uncertain.

### The Transmission of Shocks

In evaluating whether a particular liquidity problem is sufficiently severe to warrant assistance, the LLR needs to consider whether the effects will be restricted to the particular sector directly impacted by the shock or will spill over to other sectors. This requires knowledge of the processes by which shocks may be transmitted from sector to sector.

Assume an initial exogenous shock that lowers some asset prices and thereby reduces wealth in a particular sector. The most obvious transmission linkage is through changes in the money supply. As noted earlier, this channel is the focus of many analysis of LLR activities. However, in a modern economy without specie based money, a collapse of the money supply for reasons other than central bank actions can come about only through an increase in currency from a run on the banking system as a whole. Runs or deposit outflows from individual banks in the pursuit of safety are likely only to reshuffle reserves and deposits within the banking system. The fleeing funds are likely to be redeposited directly at other, perceived safe banks or indirectly through a flight-to-quality that first involves the purchase of nonbank, completely secure securities, such as Treasury securities, and then a redeposit of the proceeds by the seller of the securities in a safe bank. No reserves or money supply are lost to the system as a whole in either scenario, even if

deposits are transferred to banks overseas, and thus the cost of the runs is likely to be relatively minimal.<sup>6</sup> All runs will increase churning and uncertainty and, at least, temporarily disturb customer - bank relationships. In addition, runs to foreign currencies will affect exchange rates.

Indirect redeposits do cause more important interest rate effects as rates on public securities are bid down and those on private securities are bid up and possible exchange rate effects if deposits are transferred to banks overseas. Only if neither the initial depositors nor the sellers of the safe securities perceive any bank in the country or in other countries as well to be safe and wish to hold currency outside the banking system is the aggregate supply of money affected. Such a run reduces aggregate bank reserves and, unless offset by an equal injection of reserves by the central bank, ignites a multiple contraction of money and credit.

The reduction in the aggregate money supply will cause the impact of the shock to spread out to other sectors of the economy and, if prices are not perfectly flexible, will reduce real as well as nominal income. But, as discussed earlier, in the

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6. George J. Benston, Robert A. Eisenbeis, Paul M. Horvitz, Edward J. Kane, and George G. Kaufman, Perspectives on Safe and Sound Banking (Cambridge, MA: MIT Press), 1968, Chapter 2; George G. Kaufman "Bank Runs: Causes, Benefits and Costs" CATO Journal, Winter 1988, pp. 559-588; and Anna J. Schwartz, "The Lender of Last Resort and the Federal Safety Net" Journal of Financial Services Research, September 1987, pp. 1-18. For a contrary view see Lawrence H. Summers, "Planning For the Next Financial Crisis," Working Paper, Harvard University and National Bureau of Economic Research, October 17, 1989.

presence of both federal deposit insurance that guarantees smaller depositors the full par value of their deposits regardless of the financial solvency of their bank and a well informed central bank that may be assumed to have learned from its mistakes of the 1930s, it is highly unlikely that a shock will result in a currency run on the banking system and cause a reduction in aggregate money.<sup>7</sup> (Larger depositors cannot conduct their operations efficiently with currency and are thus unlikely to convert from deposits to currency.) That is, federal deposit insurance has made the central bank as a LLR redundant for shocks transmitted through reductions in money supply.<sup>8</sup>

But contagion may occur through other channels. Shocks that reduce wealth in a particular sector by reducing asset prices in that sector may cause defaults by debtors in that sector,

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7. Anna Schwartz notes that bank runs have been far less frequent in U.S. history than bank failures and that few runs have led to failures. For example, the Comptroller of the Currency attributes only 16 of the 353 failures of national banks between 1921 and 1925 to runs. Anna J. Schwartz, "Financial Stability and the Federal Safety Net" in William Haraf and Rose Marie Kushmeider, eds., Restructuring Banking and Financial Services in America (Washington, D.C.; American Enterprise Institute, 1988), pp. 34-62.

8. A particularly interesting example of deposit insurance dominance of the central bank in providing LLR assistance is the Canadian experience of the 1930s. It is likely that all or nearly all Canadian commercial banks were economically insolvent in this period. Yet, there were no legal bank failures or bank runs into currency as there were in the U.S. This appears to have been the result of an implicit but widely recognized 100 percent deposit guarantee by the federal government. Interestingly, there was neither explicit federal deposit insurance nor a central bank. Lawrence Kryzanowski and Gordon S. Roberts, "The Performance of Canadian Banking System: 1920-1940" in Banking System Risk: Chartering a New Course (Federal Reserve Bank of Chicago), 1989, pp. 221-232.

particularly where the debt is collateralized by assets whose prices have declined. Such defaults are most likely to occur in clearing payments for recent transactions on cash and options markets and on daily mark-to-market adjustments on futures positions. The defaults will cause a redistribution of wealth from creditors, who do not receive payments owed in full, to debtors, who do not make payments owed in full, but not a direct reduction in real wealth.<sup>9</sup> However, the defaults may ignite a chain of successive defaults as unpaid creditors may default on their debts to others, and so on, and may increase default risk premiums on bonds. As a result, the decline in asset prices may spread to other sectors.

The losses from defaults, however, may be expected to be substantially less than the value of the debt. They would only be equal to the difference between the amount owed and the fire-sale value of the underlying security. Moreover, the loss of primary concern to the LLR would be only the difference between the fire-sale value of the security and its new, lower equilibrium price. The LLR can assume either the full default loss from the initial shock or the fire-sale loss by purchasing the securities either at the last before-shock price or the estimated new equilibrium price, respectively, or by lending amounts equal to either price and holding the securities as

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9. Bernanke and Gertler argue that such a redistribution can directly impact real income adversely. See Mark Gertler "Financial Structure and Economic Activity: An Overview," Journal of Money, Credit and Banking, (August 1988), Pt. 2, pp. 559-588.



collateral. These transactions may be with either the debtors or creditors directly or with the clearing facility.<sup>10</sup>

It is important to note that defaults do not necessarily decrease aggregate credit per se. If the creditor is a bank, a default would reduce the institution's income and net worth but not its reserves and therefore not its ability to replace the extinguished loan. Indeed, even if the bank were driven into insolvency as a result of the default, aggregate reserves in the banking system remain unchanged. The credit expansion potential is transferred to other solvent banks. If the initial shock reduced wealth sufficiently, the demand for credit may be reduced and aggregate credit will decline. But offsetting this reduction is outside the scope of LLR intervention.

The Federal Reserve has also provided extended LLR assistance through the discount window to large commercial banks experiencing more solvency problems than liquidity problems.<sup>11</sup> Among others, these banks included the Franklin National Bank (1974), the Continental Illinois Bank (1984), The First Republic Bank (1987), M Corp (1988), and Bank of New England (1990). The justification for such lending is more difficult to classify. Although officially justified each time by the "too large to

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10. Direct temporary shocks to the clearing facility, due to technological or power breakdowns, such as in the Bank of New York computer failure (1985), can be analyzed in a similar framework.

11. Indeed, some cynics might argue that the best early cause of a large bank's economic insolvency is extended emergency borrowing from the Federal Reserve.

fail" doctrine, only the Continental Illinois Bank failure may, at the time, have been perceived capable of igniting a currency run on the banking system and a progressive series of defaults from losses to correspondent banks.<sup>12</sup> Ex-post, neither fear was justified. Nor were the shocks to the banks so sudden that they caused massive fire-sale losses nor so large that they directly reduced wealth sufficiently to impact aggregate income or increase risk premiums on healthy banks and cause fire-sale losses there.

It appears that such LLR assistance was motivated jointly by an atmosphere of camaraderie with fellow "bankers", desire to "buy" time to work out a solution, knowledge that the loans are fully collateralized by someone else-- the FDIC, and/or failure to understand fully the nature of the problem. In the words of Anna Schwartz, The Fed has confused "financial distress" with "financial crisis".<sup>13</sup> In such assistance, the Federal Reserve

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12. George G. Kaufman, "Are Some Banks Too Large To Fail? Myth and Reality," Contemporary Policy Issues (forthcoming). For a defense of assisting insolvent banks, see Charles Goodhart, The Evolution of Central Banks (London: London School of Economics and Political Science), 1985.

13. Schwartz, "Real and Pseudo - Financial Crises", pp. 25-28. For similar reasons, the U.S. Treasury acting as a LLR provided assistance (bailed-out) Lockheed (1971), New York City (1975), and Chrysler (1979). See also Michael D. Bordo, "The Lender of Last Resort: Some Historical Insights," Working Paper No. 3011, National Bureau of Economic Research, June 1989.

The practice of providing LLR assistance to insolvent banks is not limited to the Federal Reserve and the U.S. Similar behavior has been followed by the Bank of Canada. Kevin Dowd, "Some Lessons from the Recent Canadian Bank Failures" in George G. Kaufman, ed., Research in Financial Services: Private and Public Policies (Greenwich, CT.: JAI Press), 1989, pp. 113-128.

has effectively made discount window lending part of the safety net under too-large-to-fail institutions. There is neither precedent for such assistance in the LLR literature nor even an discussion of it in published Federal Reserve materials. Indeed, in his testimony before Congress on the Drexel Burnham failure, Federal Reserve Chairman Alan Greenspan stated that:

Then, as now, our concern was not with the fortune of a particular firm; rather it was and remains the orderly operation of the financial markets, because that is a prerequisite for the orderly functioning of the economy.<sup>14</sup>

When the Fed provides assistance directly to an economic insolvent or near insolvent but open institution, it provides time for uninsured depositors to withdraw their funds at full face value. Because the Fed collateralizes its loans fully, it will not experience losses if and when the institution fails. Rather, the losses are passed on to the FDIC.

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Interestingly, the Federal Reserve did not provide LLR assistance to Drexel Burnham during the final days of its demise. In part, this may have been motivated by the dislike of policy makers for the firm. The Wall Street Journal reported that

Drexel was getting its comeuppance and that didn't seem to bother many in the regulatory establishment. "The old Drexel Burnham Lambert that everyone knew and hated for the last 10 years is gone" said one Bush administration official.

The same article also quoted FDIC Chairman William Seidman as saying that "if the market floats through all this, then we have greater stability than we had hoped" (Alan Murray and Kevin G. Salwer, "Fed, SEC Officials Decided Hands-Off Policy Was Best," Wall Street Journal, February 14, 1990, p. A6).

14. Alan Greenspan, "Testimony before the Subcommittee on Economic and Commercial Law, Committee on the Judiciary" (Washington, D.C.); Board of Governors of the Federal Reserve System, March 1, 1990.

In sum, LLR assistance appears appropriate to offset shocks that 1) threaten to reduce aggregate money supply and 2) in the absence of a potential reduction in the money supply, ignite temporary liquidity problems that are likely to produce significant fire-sale losses that may be expected to reduce aggregate income and wealth temporarily below equilibrium levels or the levels that would exist if the markets were perfectly efficient. What constitutes a sufficient severe liquidity problem to warrant intervention is difficult to define precisely and, as is argued later in the paper, requires a careful and publicly verifiable cost-benefit analysis. Also, for reasons discussed later, there is a strong tendency for the LLR to view crises as more severe than they actually are and the costs of intervention as smaller than they actually are.

#### What Is the Cost of LLR Assistance

LLR assistance, no matter how apparent the immediate need or by whom provided, is not costless. Any government assistance that reduces losses below those that would occur as a result of market forces in the absence of such assistance incurs the danger of discouraging action by private participants to protect themselves from future market shocks. Thus, unless priced correctly, LLR assistance induces moral hazard problems by encouraging market participants to alter their behavior in a way that shifts risks to the LLR and government. This potential hazard has been described succinctly by Charles Kindleberger as

follows:

Markets generally work, but occasionally they break down. When they do, they require government intervention to provide the public good of stability... [But] if the markets know in advance that help is forthcoming under generous dispensations, they break down more frequently and function less effectively... This paradox is equivalent to the prisoner's dilemma. Central banks should act one way (lending freely) to halt the panic, but another (leave the market to its own devices) to improve the chances of preventing future panics.<sup>15</sup>

Indeed, the potential for moral hazard was noted as early as by Thornton, who wrote:

It is by no means intended to imply that it would become the Bank of England to relieve every distress which the rashness of country banks may bring upon them: the bank, by doing this, might encourage their improvidence. There seems to be a medium at which a public bank should aim in granting aid to inferior establishments, and which it must often find it difficult to be observed. The relief should neither be so prompt and liberal as to exempt those who misconduct their business from all the natural consequences of their fault, nor so scanty and slow as deeply to involve the general interests. These interests, nevertheless, are sure to be pleaded by every distressed person whose affairs are large, however indifferent or even ruinous may be their state.<sup>16</sup>

The decision whether to provide LLR assistance and at what price involves an economic cost-benefit analysis. The benefits have been described earlier and are both immediate and obvious. The costs are delayed and thus more likely both not to be perceived to be associated with the earlier and removed LLR

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15. Charles P. Kindleberger, Manias, Panics and Crashes (New York: Basic Books), 1978, pp. 6, 163.

16. Henry Thornton, An Enquiry into the Nature and Effects of the Paper Credit of Great Britian, (1802) (New York: Farrar and Rinehart) 1939 p. 188 FN.

action and to be more diffuse and difficult to measure. For example, LLR provision of liquidity to prevent fire-sale losses in a particular sector at a price below that the private market would charge is unlikely to encourage market participants in that sector to improve the mechanisms for achieving increased liquidity through private means. As a result, the LLR is more likely to be required to provide assistance again in the future and the sector is effectively being subsidized by being permitted to operate less efficiently than otherwise. Moreover, in the process, participants are encouraged to assume greater risk exposure than they would if they had to absorb the full share of the losses.

Similarly, assistance to economically insolvent banks encourages the banks to increase their own risk exposures as they have little if any of their own shareholder funds at risk, discourages other banks from reducing their risk exposures, and frequently provides sufficient time for uninsured depositors to shift their funds elsewhere at full par value before the bank is declared legally insolvent and the value of their deposits is reduced. Any loss from such resolution delays is borne by the FDIC and the taxpayer. Thus, the costs of potential future LLR intervention are substantially larger than the costs of current intervention. But, the discount rate used by policy makers, who are under considerable political pressure to optimize economic performance in the short-term and whose term of office is relatively short and not guaranteed to last until the next

crisis, is likely to be overestimated, so that the present value of the current benefits of intervention are likely to be found greater than the present value of the future costs. As a result, the benefit of any doubts will be resolved in favor of current intervention. In the words of Kindleberger:

Actuality inevitably dominates contingency. Today wins over tomorrow.<sup>17</sup>

#### How Should LLR Intervention Be Provided and Priced

LLR intervention by the central bank may be provided in either of two ways; 1) through the discount window and 2) through open market operations. The discount window has been the traditional means of providing LLR assistance both because it was the major tool of central banking before the development of broad financial markets that permitted open market operations to be conducted and because it could direct the assistance more precisely to the particular sector under pressure. As financial markets developed in breadth and resiliency, not only did open market operations preempt the discount window as the major tool of policy, but they reduced the need for the central bank to direct its actions at particular sectors as the market could now direct funds made available anywhere in the system to the affected sector efficiently. The Federal Reserve appears to have recognized these changes in its "Reappraisal of the Federal Reserve Discount Mechanism" study when it concluded that:

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17. Kindleberger, p. 163.

Under present conditions, sophisticated open market operations enable the System to head off general liquidity crisis, but such operations are less appropriate when the System is confronted with serious financial strains among individual firms or specialized groups of institutions... It is in connection with these limited crisis that the discount window can play an effective role as 'lender of last resort'.<sup>18</sup>

Recent Federal Reserve operations that may be classified as LLR intervention appear to have been divided between open market and discount window assistance in line with the Fed's statement. Assistance was provided primarily through the discount window in the Franklin National Bank (1974), the Continental Illinois Bank (1984), the Texas banks (1987-89) and the Bank of New England (1990) failures and through open market operations in the October 1987 and 1989 stock market breaks.<sup>19</sup> This division may have been determined at least in part by a recognition of the probable insolvency of the banks and the unlikelihood that funds would be directed to them by the private market. Unlike the FDIC, the Federal Reserve is in an enviable position as a LLR. As noted earlier, because it requires full market value collateralization of its discount window loans, it can lend freely to economically insolvent banks, if it so wishes, without fear of suffering losses. Any loss is shifted to the FDIC and, if sufficiently

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18. Board of Governors of the Federal Reserve System, Reappraisal of the Federal Reserve Discount Mechanism: Report of a System Committee (Washington, D.C.), 1968. P. 17.

19. In the Penn Central failure (1970) the Fed announced its intentions to provide liquidity if necessary, but apparently did not have to do so. This is consistent with Bagehot's strategy.



large, to the taxpayer. This moral hazard problem can be reduced by requiring the Fed to obtain permission from the FDIC before extending emergency assistance through the discount window.<sup>20</sup>

Reliance on open market operations to provide assistance also reduces the political pressures on the LLR to assist all entities in financial distress, in particular, financially weak but politically strong entities, e.g., commercial banks, directly through the discount window. The private market is less likely to direct additional funds provided by open market operations to such entities.

Lastly, open market operations eliminate the need to price LLR assistance correctly. By definition, funds provided through open market operations are priced at the current market rate for the particular securities involved. In contrast, funds provided through the discount window need to be priced administratively and, if priced incorrectly, may reduce the effectiveness of the assistance. If the discount rate charged is too low, too much assistance is likely to be provided with resulting subsidies and encouragement to risk taking. If the discount rate is too high, insufficient assistance is likely to be provided. Identifying the correct price is, however, not an easy task and unlikely to be achieved at all times. As noted earlier, many students of LLR intervention have suggested that the assistance be provided at a "penalty" rate to avoid underpricing, discourage undue use, and compensate for the risk premium that the market assigns to such

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20. George J. Benston, et al., Chapt. 5.

funding. But "penalty" rate is by necessity an imprecise concept that is as likely to be mispriced as priced correctly. This reduces the usefulness of Bagehot's rule to lend freely, but at a high (penalty) rate. Thus, open market operations appear to be more efficient way of providing LLR assistance.

Only if the central bank had superior or more timely information about the nature of the crisis or the participants involved than the market does, should providing assistance through the discount window dominate open market operations. Because it is unlikely that the Federal Reserve has such knowledge at all or even most of the time, providing LLR assistance through the discount window should be limited to rare occasions. Moreover, the LLR may not find it easy, particularly on short notice, to differentiate between good and bad security or solvent and insolvent banks. Thus, open market operations also make it unnecessary to worry not only about the correct rate to charge but also about the correct borrowers to whom to lend, in particular, about providing assistance to those experiencing the initial shock, who may be expected to exert the greatest pressures on the LLR.

### Summary and Conclusion

This paper has argued that the concept of LLR intervention has changed substantially since its original development in the early 1800s. In large part, this change has reflected the changes in the economic structure in the intervening years. This

change in the appropriate role for the LLR has not been fully appreciated by many analysts. The justification for LLR intervention has always been to minimize, if not prevent, the effects of financial crises on real income and levels of economic activity. It was and is viewed as temporary separate from central bank operations to influence income, employment, and price through time. In the early days, adverse shocks to the economy were likely to spill over to initially unaffected sectors and potentially the economy as a whole through reductions in the money supply. Thus, early analysts gave heavy weight in justifying LLR intervention to the protection of the money supply. But since the abandonment of specie-based money and later the introduction of federal deposit insurance, collapses of the money supply have become highly unlikely.

The second reason for LLR intervention was to offset temporary liquidity strains from adverse shocks that induced large number of market participants to reassess quickly their asset portfolios and sell some assets without a concurrent threat to the money supply. If the trading mechanics of the particular market were not sufficiently efficient, fire-sale losses would be incurred that would temporarily depress aggregate real income and serve no lasting social or economic purpose. As Bagehot noted long ago, the LLR could prevent these by providing additional funds freely. This reason remains valid today and justifies LLR assistance such as was provided in response to the October 1987 stock market break. It is, however, important to note that the

LLR should attempt to offset only the potential fire-sale losses associated with an adverse shock, not the adverse income effects of the shock itself. As is well recognized, monetary actions can at best affect real income only marginally and temporarily. Likewise, assistance to insolvent banks and other individual entities directly is inappropriate and inefficient. Solvency problems should not be hidden under the cloak of liquidity problems.

To reduce problems of correctly pricing the assistance, providing assistance to equilibrium insolvent institutions, and succumbing to political pressures to direct assistance to special institutions, LLR assistance, if provided by the Federal Reserve, should be provided through open market operations. Only if the Federal Reserve can clearly demonstrate that it has superior information than the market should assistance be provided through the discount window and then only after receiving permission from the FDIC, the ultimate bearer of any losses, to reduce the moral hazard problem. LLR assistance through the discount window should be viewed as an integral part of the federal safety net along with deposit insurance.

LLR assistance to offset liquidity strains cannot be justified solely on the basis of an actual or perceived crisis. If it is not priced correctly, such assistance can cause the same kinds of moral hazard problems as federal deposit insurance has in recent years with similar high costs to society. The beneficiaries of the assistance may be encouraged not to improve

the efficiency of the market to avoid similar future liquidity crisis, rather than to protect themselves from suffering fire-sale losses. Indeed, they are likely to assume greater risk as any losses will be borne by others. In the case of insolvent banks, the assistance also provides time for uninsured depositors to flee unscathed. Thus, LLR assistance either through open market operations or the discount window should be required to be justified by a comprehensive and reproducible benefit-cost analysis before it is provided, possibly reviewed for approval by an independent body, such as the General Accounting Office.

Because shocks generally do not announce themselves in advance, contingency analyses for different types of shocks should be prepared and approved before hand. LLR assistance would then be limited to instances where the present value benefits of intervention outweighs the present value costs. To the extent cost/benefit analysis presently is more an art than a science, the justification for the timing and magnitude of LLR intervention will remain relatively imprecise. But it is in the best longer-run interests of both the LLR and the economy if the rules could be specified as precisely as possible, maintained at all times, and publicized widely.

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